10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

Miscellanea

ooo

PAUL RIVET

OCTOGENARIO DICATA

I

XXXI CONGRESO INTERNACIONAL DE AMERICANISTAS

UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

1958

[TITLE PAGE]

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

A LACUSTRINE ECONOMY IN CALIFORNIA[1]

RALPH L. BEALS AND JOSEPH A. HESTER, JR.

121 IN ANOTHER PAPER we have proposed a new ecological classification of the Indians of California.[2] In this paper, we describe in more detail an example of a lake ecological type. The example is chosen because it departs widely from the usual conception of the acorn economy of
101 the California Indians. The description will center on the Tachi, a group of southern valley Yokuts, who are the best known of the lake-based tribes.

131 The southern valley Yokuts, with their neighbors, the Buena Vista Yokuts, occupy the central and western portion of the San Joaquin Valley in California. The region is predominately a desert environ-
132 ment approximating the type of the Mohave Desert. The mean July temperature ranges from 84 degrees in the valley to approximately 78 degrees in the foothills away from the valley, but summer daily maxima frequently are above 100 degrees, while mean January temperatures are between 40 and 44 degrees. The average annual precipitation for much of the area is less than 5 inches but rises to 10 inches toward the foothills. Some minor areas may register 15 to even 20 inches in the coast range mountains to the west, although it is not known that the Yokuts utilized these areas. In the modified Köppen classification, at least 85 percent of the area has a BWh climate similar to that of the Mohave Desert. Most of the remainder has hot steppe-

---

[1] This paper is the product of a research program on California Indian Ecology conducted at the University of California, Los Angeles by Ralph L. Beals, Director, and Joseph A. Hester, Jr., Associate Director, and a staff of assistants. We are indebted to Dr. Harold Driver, University of Indiana, for suggestions.

[2] "A New Ecological Typology of the California Indians". Paper presented at the International Congress of Anthropological and Ethnological Sciences, Philadelphia, 1956.

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

climate (BSh), distributed mainly along the western margin and sporadically elsewhere.

Soils throughout most of this region are of alluvial valley or valley terrace type. Extensive areas of these are either poorly drained acid soils or are heavily saline, supporting little or no useful vegetation. In the hills to the west and south, are some areas of neutral upland soils, normally favorable to the growth of hardwood trees, especially oaks. In this instance, however, these soils usually are barren because of aridity. In the habitat of the Buena Vista Yokuts, there are only 96 square miles covered predominantly with hardwood trees, but this includes no oaks or other trees economically useful from the standpoint of Indian technology. In the coast ranges to the west of the southern valley Yokuts are 163 square miles occupied by woodland-grass associations (a park landscape of mixed grass and hardwoods) but the trees here are sparse with relatively few oaks. Although included in the area usually attributed to the southern valley Yokuts, there is no evidence that this upland region was exploited. Over most of the entire habitat attributed to the southern valley Yokuts a sparse desert type vegetation prevailed.[3]

The rather grim desert environment was mitigated by streams flowing from the mountains. Many of these, especially those draining from the high Sierra Nevada to the east were perennial. Virtually all the drainage went into three shallow basins of Tulare, Kern, and Buena Vista lakes. Only in years of unusually high precipitation in the mountains did overflow water from the lakes drain into the San Joaquin River system and hence reach the ocean. Along streams and stagnant sloughs occurred some shrubs and trees and river bottoms might support lush grasses. The vegetation of primary economic importance was the tule which grew along streams and sloughs and especially in the extensive *tulares* around the marshy margins of the lakes. Tule, hispanicized from the Nahuatl *Tollin*, here is the bullrush, chiefly *Scirpus acutis*.

Fish, shellfish and waterfowl were the most abundant animal forms. Few deer existed in the area. The California deer is a browsing

[3] See Weislander and Jensen for vegetation data and Storie and Weir for soils data. Other environmental data are summarized from compilations made by the project on a state-wide basis, utilizing a wide variety of government documents, geographical and ethnographic reports, too numerous to list in this short paper, supplemented by spot field observations.

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

animal, not a grazing animal and few suitable shrubs and trees grow in the region. There were some herds of antelope, especially in the eastern portions, and some tule elk. Even rabbits were less numerous than in adjoining regions. In the most favorable sections burrows were periodically flooded while elsewhere feed was scanty.

The Tachi Yokuts were located north and west of Tulare Lake. Of the eight locatable Tachi settlements, six were on the sloughs near Tulare Lake or on the shores of the lake itself; two were on the dry plains west of the lake.[4] Each settlement consisted of one, and in most cases probably several, long wedgeshaped houses covered with tule mats and housing several families. Latta claims these sometimes reach the length of 300 feet but most writers consider this excessive.[5] Kroeber cites Gabriel Moraga who visited the Tachi in 1806 and records the range of some 60 to 800 persons for southern Yokuts villages.[6] Moraga's report is suspect but other data suggest that most Tachi villages contain several hundred people.[7]

The location of settlements was importantly influenced by the location and permanence of water. The lake shore itself offered difficulties, for the surrounding terrain is relatively flat and in some places a change of lake level of one foot would shift the lake margin as much as 4 miles.[8] According to Gifford and Schenck when the lake surface was 192 feet above sea-level, only 300 square miles was covered, but at its highest level of 220 feet, the area was 800 square miles. The highest level was unstable and villages located with reference to this might at many times have no access to water. The 500 square miles between the lower and the highest level, was marshly and "an area in which man could not have resided permanently."[9] Consequently, the most desirable sites were on permanent sloughs offering access to the lake but located on ground high enough to be out of flood water. Some of the Yokuts, possibly including the Tachi, when they could not find a sufficiently elevated house site would raise the floor by carrying in baskets of earth. In addition, the Tachi and

[4] GAYTON, 1948 map. 2; KROEBER, p. 484, plate 47; LATTA, p. 13.
[5] LATTA, p. 90.
[6] KROEBER, p. 491.
[7] GAYTON, 1948, p. 13.
[8] LATTA, p. 30.
[9] GIFFORD and SCHENCK, pp. 8-11.

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

513 their neighbors raised their sleeping places on a low frame of willow poles.[10]

221 [312] 361 [137] The settlements to the west apparently suffered from lack of water and during the summer and fall dry season residents in those villages commonly moved to the vicinity of the lake. Gayton says: "On the west side was a comparatively barren area, almost treeless and waterless, practically uninhabited, used little save for rabbit drives..."[11] In contrast, the residents of permanent villages on the lake frequently left during the summer to gather seeds and to hunt. Apparently they usually went eastward, if they traveled any distance, and in part collected on lands used by some of their eastern neighbors.

824 [501] The economy of the Tachi was dominated by the resources of the lake and its tributary sloughs. The tule provided essential materials for house construction and for the making of balsas which were essential for the exploitation of many of the lake resources and were used extensively in transportation as far away as the east side of the San Joaquin Valley. Tule roots and seeds provided a major part of the vegetable food, and the *Tular* harbored small animals and the tule elk. The major subsidiary vegetable foods apparently were the bulbs of the brodiaea, easily obtainable in quantity in sandy spots, and grass seeds. In part, the latter were obtained from marked plots owned by particular women and inherited by their daughters, a sister, or other female sociological relative. Acorns are rarely mentioned and when obtained were apparently either secured by visits to the territory of other groups or were obtained in trade. The Choinimni to the east are especially mentioned as floating down the Kings Rivers on balsas to exploit the lake resources and to bring acorns and other materials in trade.

262 824 [423] [428] 439

136 262 826 The river mussel (*Anodonta nuttaliana* Lea) probably was the most important source of animal protein. Other less abundant mollusks were utilized and fish were fairly important in the diet. The terrapin (*Clemmys marmorato*) and waterfowl were important resources.

136 [224] In contrast land mammals apparently were not abundant. The largest, the tule elk, was snared or speared in the tule swamps but apparently seldom was attacked on dry land. During most of the year, the area offered little food for grazing animals such as the antelope. Even rabbits seem not to have been abundant, for the Tachi apparently [439]

[10] GAYTON, 1948, p. 13.
[11] GAYTON, 1948, p. 6.

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

did not secure enough rabbit skins for their own needs, securing additional skins in trade from the east.

These conclusions are supported by data from the only large archeological excavations in the near vicinity, on Buena Vista lake to the south, with very similar environmental conditions. Wedel reports that at one site in 3700 cubic yards excavated only 1053 animal bones were recovered. Of these, 411 were bird bones and 142 terrapin bones. Elk and antelope numbered 61 and 45 respectively. Two hundred and one rabbit bones were found, most of them jack-rabbits (*Lepus*). In contrast to the small number of elk and antelope bones, bones from the genus *Canis* (probably mostly domestic dogs, but including some coyote) numbered 127.[12]

The Tachi, to some extent, were middlemen in the trade of sea shells from the ocean to the interior and are reported to have done some processing of ocean shells secured in trade from neighbors to the west. Considering their environment, the Tachi apparently were dependent upon their neighbors, especially those to the east, for the following items: obsidian, steatite, stone mortars, oak mortars, pestles and sinew backed juniper bows. In addition, they traded for pottery, basketry, pigments, rabbitskins and rabbitskin blankets and acorns. In exchange they provided lake products including fish, tule mats, salt from salt grass and shell "money" they manufactured from shells secured in trade. That the lake resources were important is indicated by the fact that, although some Yokuts' neighbors were allowed to visit the lake themselves, trade with westerners was carried on at a distance from the lake apparently in part with the intention of preventing them from learning the techniques of securing the products.

The picture emerges clearly, then, of a desert-dwelling people who, paradoxically, were oriented toward a water-based economy. Without the lakes, marshes, and sloughs, the land would have supported only the scantiest population, and, in fact, large areas, especially to the west, were rarely visited. For the Tachi the acorn appears as a relatively unimportant luxury and not as a staple.

If we turn to non-material culture, the differences between the lake dwellers as exemplified by the Tachi, and the acorn using Yokuts to the east, largely disappear. In the existence of "tribes" sharing a common dialect and capable of common action, the existence of semi-

[12] WEDEL, p. 11. The remaining data on the Tachi and their neighbors are from Gayton, Kroeber and Latta.

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

105 184 permanent villages from which people moved seasonally or for brief periods to obtain particular products, the internal importance of family, extended family and lineage, the cross-cutting of villages by a moiety organization which provided chieftainship, village exogamy and a tendency towards moiety exogamy — in these and other respects there appears little diference between the Tachi and their eastern neighbors. Undoubtedly full information would show some differences in detail. For example, it appears likely that Tachi women contributed less to the food supplies than did the women of acorn using tribes, but this does not appear to be reflected in the social roles.

182 619 It would seem, therefore, that the lake ecology, different though it may appear, supports similar social conditions to those of the acorn [621] using tribe In each case the pattern is that of the permanent village with some hundreds of people who are able to get the bulk of their subsistence within a relatively restricted area supplemented only by [361] periodic or seasonal absences. The close proximity of settlements in [162] each case, the relatively high density of population with respect to major resource areas, the seasonal fluctuation in availability and location of major resources, all favor the existence of mechanisms for settling or preventing intra-tribal disputes and possible conflicts with [616] similar neighboring groups. The moiety organization cut across the village organization, contributing to the cohesiveness of the tribe as well as providing a mechanism for diffusing power and for the selection of chiefs. The equatibility of moieties among various Yokut tribes perhaps also contributed to stable intertribal relationships. A similar [574] function was served by the sharing of common resources in some cases, and by the exchange of hospitability in connection with religious ceremonials.

182 616 It appears to us at present, however, that the moiety is not essential to the functioning of social systems under either lake or valley [194] conditions. The northern Yokuts lack moieties and they are absent among other linguistic groups occupying similar environments.

182 231 Our conclusion is that substantially different ecological adaptations may be associated with quite similar social organizations providing the possibility of similar groupings of people exist. In the present instance both the lake and the acorn adaptations provide relatively abundant and reliable food supplies within limited areas, permitting the forming of fairly large and fairly stable communities. It is this fact, rather than a direct ecological relationship, which has permitted

10: Beals & Hester E-4, 5 (no date) 1958
NS29 Yokuts NS29

the Yokuts to develop very similar social systems within two different environments. In subsequent papers we hope to show that alternative systematizations are also possible for groups with the same basic ecological adaptations. 182 221

University of California at Los Angeles.

BIBLIOGRAPHY

GAYTON, A. H., "Yokuts-Mono Chief and Shamans", *Univ. of Calif. Publications in American Archeology and Ethnology*, vol. 24, No. 6, pp. 361-420, Berkeley, 1930. 113

——"Yokuts and Western Mono Social Organization", *American Anthropologist*, vol. 47, No. 3, pp. 409-426, 1945.

——"Yokuts and Western Mono Ethnography I: Tulare Lake, Southern Valley and Central Foothill Yokuts", *Anthropological Records*, vol. 10, No. 1, pp. 1-142. Berkeley and Los Angeles, 1948.

GIFFORD, E. W. and SCHENCK, W. E., "Archaeology of the Southern San Joaquin Valley, California", *Univ. of Calif. Publications in American Archeology and Ethnology*, vol. 23, No. 1, pp. 1-122, Berkeley, 1926.

KROEBER, A. L., *Handbook of the Indians of California*, Bulletin 78, Bureau of American Ethnology, Washington, D. C., 1925.

LATTA, Frank F., *Handbook of Yokuts Indians*, Oildale, California, 1949.

STORIE, R. E. and WEIR, W. M., *Generalized Soil Map of California*, Univ. of Calif. College of Agr., Agr. Exper. Station and Extension Service, Berkeley, 1951.

WEDEL, Waldo, *Archeological Investigations at Buena Vista Lake, Kern County, California*, Bulletin 130, Bureau of American Ethnology, Washington, D. C., 1941.

WEISLANDER, A. E. and JENSEN, H. A., *Forest areas, timber volumes and vegetation types in California*, U. S. Forest Service, Calif. Forest and Range Exper. Station, Berkeley, Forest Survey Release No. 4, pp. 1-66, 1946.